

# STEVEN WALKER

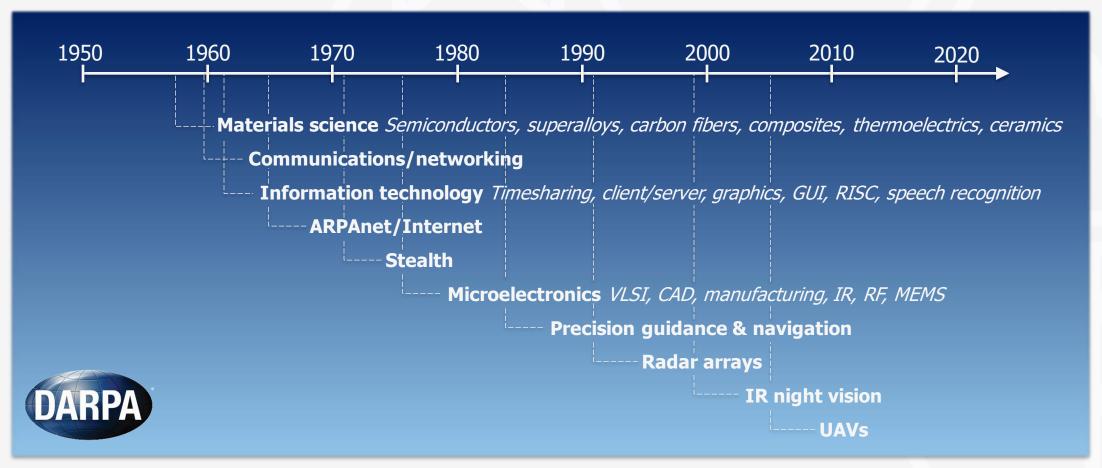
**DIRECTOR**DARPA



THE DARPA MISSION

### **DARPA'S MISSION**

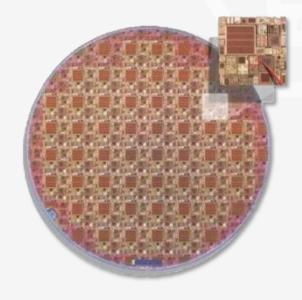
Breakthrough Technologies and Capabilities for National Security



DARPA's role: Pivotal early investments that change what's possible

# **VERY LARGE SCALE INTEGRATION (VLSI)**

# Metal Oxide Semiconductor Implementation Service (MOSIS)



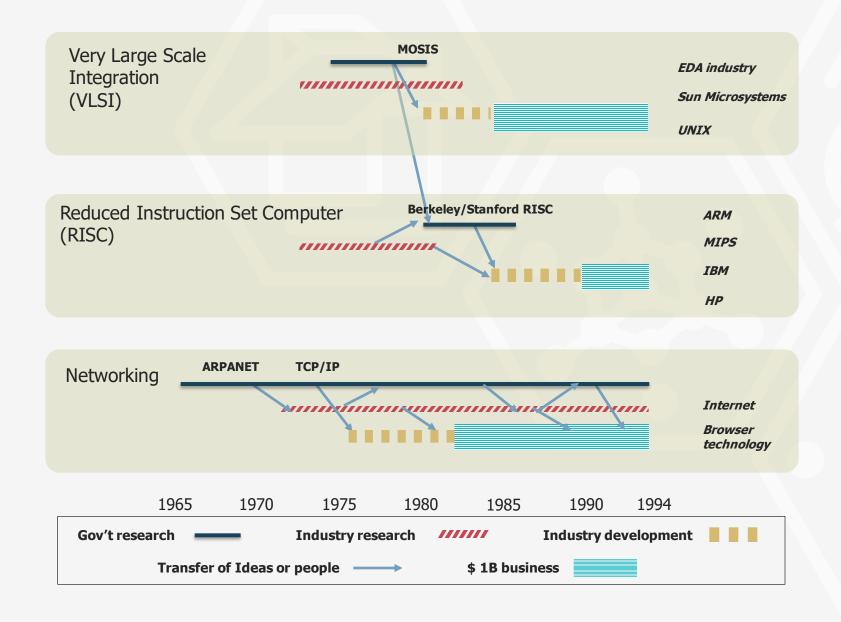
Forerunner of the fabless industry

# **Reduced Instruction Set Computer (RISC)**



Forerunner of the mobile industry's architecture

### **GOVERNMENT INVESTMENT IN ELECTRONICS**

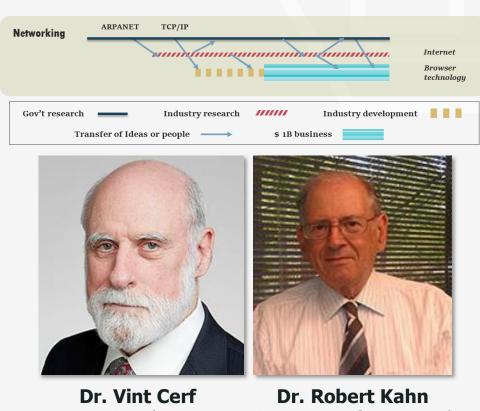


### DARPA'S 60TH ANNIVERSARY SYMPOSIUM

September 5-7, 2018

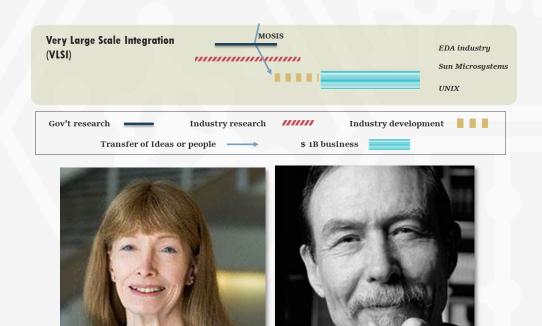
Gaylord National Harbor, MD

Register at d60.darpa.mil/registration



**Dr. Vint Cerl**Google

**Dr. Robert Kahn**Corporation for National
Research Initiatives



**Dr. Lynn Conway** University of Michigan

**Dr. Carver Mead**California Institute of Technology

## WHERE DO WE GO NEXT? AI INVESTMENT STRATEGY

#### Computers as Tools

80 Programs use AI, 25 Programs on AI Future

#### Computers as Partners

Sustained Investment to Advance AI



Collaborative Operations in Denied Areas



Adaptive Autonomous ISR

Assurance for Machine

Learning-enabled

Assured Autonomy

Cyber Security

AI Hardware

Machine Learning



Automated Cyber Investigations at Scale

Systems



Neuromorphic Processor



Bio-inspired Lifelong Learning Machine

Explainable AI

This is a Russian tank; it has a rounded front fender.

#### **Common-sense reasoning**

- Theory of other minds (motivations of actors)
- Causal reasoning from naïve qualitative physics
- Representation and use of world knowledge

# Theoretical foundations of machine learning

- Adversarial issues
- Performance/robustness characteristics
- Game theoretic countering of autonomous systems

# Application of AI to complex DoD problems

- C&A in a day
- Continuous clearance
- Brain control of prosthetic limbs

#### **Robust AI**

Guarantee Performance

#### **Adversarial AI**

Understand Attack Surface

# High Performance AI

Maximize Power, Reduce Energy

#### Next Generation AI

Ensure Technical Advantage

# New Capabilities

Create Technical Surprise

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# ERI ELECTRONICS RESURGENCE INITIATIVE

# S U M M I T

2018 | SAN FRANCISCO, CA | JULY 23-25